

***FlyBy Math™* Alignment**
Mathematics Grade Level Expectations
March 20, 2006 v.5

Strand: Number, and Operations

Grade-Level Expectations

M(N&O)–5–7 **Makes estimates** in a given situation by identifying when estimation is appropriate, selecting the appropriate method of estimation, determining the level of accuracy needed given the situation, analyzing the effect of the estimation method on the accuracy of results, and evaluating the reasonableness of solutions appropriate to grade level GLEs across content strands.

***FlyBy Math™* Activities**

--Predict outcomes and explain results of mathematical models and experiments.

Strand: Geometry and Measurement

Grade-Level Expectations

M(G&M)-5-7 **Measures and uses units of measures appropriately and consistently, and makes conversions within systems when solving problems** across the content strands.

***FlyBy Math™* Activities**

--Calculate and measure the position and time of simulated aircraft. Represent that motion using tables, graphs, equations, and experimentation.

M(G&M)–5–9 **Demonstrates understanding of spatial relationships using location and position** by interpreting and giving directions between locations on a map or coordinate grid (all four quadrants); plotting points in four quadrants in context (e.g., games, mapping, identifying the vertices of polygons as they are reflected, rotated, and translated); and determining horizontal and vertical distances between points on a coordinate grid in the first quadrant.

--Plot points on a schematic of a jet route, on a vertical line graph, and on a Cartesian coordinate system to describe the motion of two airplanes.

--Calculate and measure the position and time of simulated aircraft. Represent that motion using tables, graphs, equations, and experimentation.

Strand: Functions and Algebra

Grade-Level Expectations

M(F&A)-5-1 **Identifies and extends to specific cases a variety of patterns** (linear and nonlinear) represented in models, tables, sequences, or in problem situations; and writes a rule in words or symbols for finding specific cases of a linear relationship.

***FlyBy Math™* Activities**

--Represent distance, speed, and time relationships for constant speed cases using tables, bar graphs, line graphs, equations, and a Cartesian coordinate system.

<p>M(F&A)-5-2 Demonstrates a conceptual understanding of linear relationships ($y = kx$) as a constant rate of change by identifying, describing, or comparing situations that represent constant rates of change.</p>	<p>--Represent distance, speed, and time relationships for constant speed cases using linear equations and a Cartesian coordinate system.</p> <p>--Use graphs to compare airspace scenarios for both the same and different starting conditions and the same and different constant (fixed) rates.</p>
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Strand: Data, Statistics, and Probability

Grade-Level Expectations	<i>FlyBy Math™</i> Activities
<p>M(DSP)–5–1 Interprets a given representation (tables, bar graphs, circle graphs, or <u>line graphs</u>) to answer questions related to the data, to analyze the data to formulate or justify conclusions, to make predictions, or to solve problems.</p> <p>(IMPORTANT: <i>Analyzes data consistent with concepts and skills in M(DSP)–5–2</i>)</p>	<p>--Use tables, bar graphs, line graphs, a Cartesian coordinate system, and equations to model aircraft conflicts and predict outcomes.</p> <p>--Explain and justify solutions regarding the motion of two airplanes using the results of plotting points on a schematic of a jet route, on a vertical line graph, and on a Cartesian coordinate system.</p>
<p>M(DSP)-5-3 Identifies or describes representations or elements of representations that best display a given set of data or situation, consistent with the representations required in M(DSP)-5-1</p> <p>(IMPORTANT: <i>Analyzes data consistent with concepts and skills in M(DSP)–5–2</i>)</p>	<p>--Choose among tables, bar graphs, line graphs, a Cartesian coordinate system, and equations to model aircraft conflicts and predict outcomes.</p> <p>--Represent distance, rate, and time data using tables, line plots, bar graphs, and line graphs.</p>
<p>M(DSP)–5–6 In response to a teacher - or student-generated question or hypothesis, decides the most effective method (e.g. survey, observation, experimentation) to collect the data (numerical or categorical) necessary to answer the question; collects, organizes and appropriately displays the data; analyzes the data to draw conclusions about the questions or hypothesis being tested, and when appropriate makes predictions, asks new questions, or makes connections to real-world situations.</p> <p>(IMPORTANT: <i>Analyzes data consistent with concepts and skills in M(DSP)–5–2</i>)</p>	<p>--Conduct simulation and measurement for several aircraft conflict problems.</p> <p>--Represent distance, rate, and time data using tables, line plots, bar graphs, and line graphs.</p> <p>--Use tables, bar graphs, line graphs, equations, and a Cartesian coordinate system to draw conclusions.</p>

Strand: Problem Solving, Reasoning, and Proof

Grade-Level Expectations 3-5

M(PRP)–5–1 **Students will use problem-solving strategies to investigate and understand increasingly complex mathematical content** and be able to:

- Determine the reasonableness of solutions to realworld problems.
- Generalize solutions and apply strategies to new problem situations.
- Add to the repertoire of problem-solving strategies (e.g., looking for similar problems) and use those strategies in more sophisticated ways.
- Solve problems with multiple solutions, recognize when a problem has no solution, and recognize problems where more information is needed.
- Translate results of a computation into solutions that fit the real-world problem

FlyBy Math™ Activities

--Apply mathematics to solving distance, rate, and time problems for aircraft conflict scenarios.

Strand: Communication, Connections, and Representations

Grade-Level Expectations 3-5

M(CCR)–5–1 **Students will communicate their understanding of mathematics** and be able to:

- Discuss mathematical ideas and write convincing arguments.
- Understand, explain, analyze, and evaluate mathematical arguments and conclusions presented by others.
- Ask clarifying and extending questions related to mathematics they have heard or read about.
- Understand and appreciate the economy and power of mathematical symbolism and its role in the development of mathematics.
- Demonstrate an understanding of mathematical concepts and relationships through a variety of methods (e.g., writing, graphing, charts, diagrams, number sentences, or symbols).
- Use a variety of technologies (e.g., computers, calculators, video, probes) to represent and communicate mathematical ideas.

FlyBy Math™ Activities

--Predict outcomes and explain results of mathematical models and experiments.

--Explain and justify solutions regarding the motion of two airplanes using the results of plotting points on a schematic of a jet route, on a vertical line graph, and on a Cartesian coordinate system.

Grade-Level Expectations 3-5

M(CCR)–5–2 **Students will create and use representations to communicate mathematical ideas and to solve problems** and be able to:

- Use physical models and diagrams to represent important mathematical ideas (e.g., multiplication).
- Use appropriate representations to solve problems or to portray, clarify, or extend a mathematical idea.
- Recognize equivalent representations of concepts and procedures and translate among them as appropriate (for example, understand how the addition of whole numbers, fractions, and decimals are related).

***FlyBy Math™* Activities**

--Represent distance, rate, and time data using tables, line plots, bar graphs, and line graphs.